
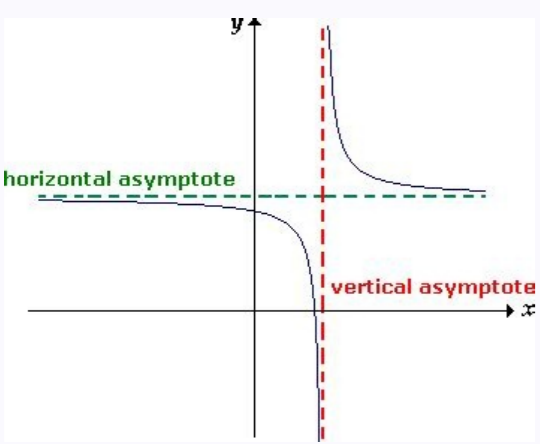


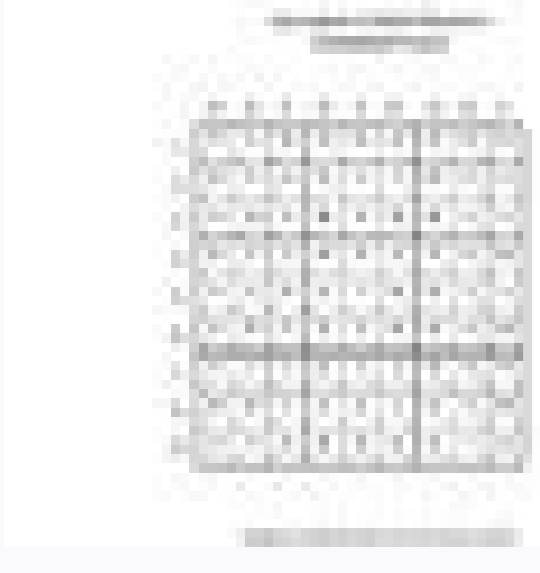
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Asymptotes of rational functions worksheet pdf online



Handwritten notes showing the process of finding asymptotes for a rational function. It includes the function $f(x) = \frac{x-1}{x+1}$ and the steps to find the vertical asymptote at $x = -1$ and the horizontal asymptote at $y = 1$.



Honors Algebra 2 Graphing Radicals 5.6 - Notes

Writing Equations given the transformations:

1. The parent function $f(x) = \sqrt{x}$ is a square root. It is reflected across the x-axis, stretched vertically by a factor of 4, and translated 1 unit down.
2. The parent function $f(x) = \sqrt[3]{x}$ is a cube root. It is stretched horizontally by a factor of 2, reflected across the y-axis, and translated 3 units left.

Graphing Radicals with transformation. Use your graphing calculator to plot points.

1. $f(x) = \sqrt{x+6}$ "Shoof"
* Left 6
v: (-6, 0)
2. $f(x) = 3\sqrt{x}$ "free style swim"
* vert. stretch by 3
v: (0, 0)
3. $f(x) = -\sqrt{x-3}$ "backstroke swim"
* reflect x-axis
* down 3
v: (3, 0)
4. $f(x) = \sqrt[3]{x-2} + 3$ "free style swim"
* right 2
* up 3
v: (2, 3)

* A reflection on a cube root would turn it into "backstroke swim"

Rational Function Cards: Investigation 1	
$f(x) = \frac{x^2-4}{x^2+1}$ Factored: $\frac{(x-2)(x+2)}{(x^2+1)}$	$f(x) = \frac{x^2-9}{x^2+4}$ Factored: $\frac{(x-3)(x+3)}{(x^2+4)}$
$f(x) = \frac{x^2-1}{x^2+2}$ Factored: $\frac{(x-1)(x+1)}{(x^2+2)}$	$f(x) = \frac{x^2-16}{x^2+5}$ Factored: $\frac{(x-4)(x+4)}{(x^2+5)}$
$f(x) = \frac{x^2-25}{x^2+3}$ Factored: $\frac{(x-5)(x+5)}{(x^2+3)}$	$f(x) = \frac{x^2-36}{x^2+6}$ Factored: $\frac{(x-6)(x+6)}{(x^2+6)}$

$f(x) = (2x - 3)/(x^2 + 4)$ 1. How to find horizontal asymptote? If degree of numerator > degree of denominator then the graph of $y = f(x)$ will have no horizontal asymptote. If degree of numerator = degree of denominator then the graph of $y = f(x)$ will have a horizontal asymptote at $y = \text{an/bm}$. If degree of numerator < degree of denominator then the graph of $y = f(x)$ will have a horizontal asymptote at $y = 0$ (i.e., the x-axis). Answer: $f(x) = 1/(x + 6)$ Step 1: In the given rational function, the denominator is $x + 6$. Step 2: Equate the denominator to zero and solve for x . $x + 6 = 0 \Rightarrow x = -6$. Step 3: The equation of the vertical asymptote is $x = -6$. $f(x) = (x^2 + 2x - 3)/(x^2 - 5x + 6)$. Show Video Lesson Graphing Rational Functions, $n > m$ There are different characteristics to look for when creating rational function graphs. Try the given examples, or type in your own problem and check your answer with the step-by-step explanations. With rational function graphs where the degree of the numerator function is greater than the degree of the denominator function, there is no horizontal asymptote, but there may be an oblique asymptote. Thank you very much for your cooperation. Find the equation of vertical asymptote: 1. In order to continue enjoying our site, we ask that you confirm your identity as a human. With rational function graphs where the degree of the numerator function is equal to the degree of denominator function, we can find a horizontal asymptote. Answer: $f(x) = (2x - 3)/(x^2 + 4)$ Step 1: In the given rational function, the denominator is $x^2 + 4$. Step 2: Equate the denominator to zero and solve for x . $x^2 + 4 = 0 \Rightarrow x^2 = -4 \Rightarrow x = \pm\sqrt{-4} = \pm 2i$ (Imaginary) Step 3: When we equate the denominator to zero, we don't get real values for x . So, there is no vertical asymptote. Horizontal Asymptote: The horizontal line $y = b$ is called a horizontal asymptote of the graph of $y = f(x)$ if either The graph of $y = f(x)$ will have at most one horizontal asymptote. Show Video Lesson Try the free Mathway calculator and problem solver below to practice various math topics. onlinemath4all.com The following diagrams show how to find the horizontal asymptotes of rational functions. How to recognize when a rational function has a horizontal asymptote, and how to find its equation. WORD PROBLEMS HCF and LCM word problems Word problems on simple equations Word problems on quadratic equations Algebra word problems Word problems on trains Area and perimeter word problems Word problems on direct variation and inverse variation Word problems on unit price Word problems on comparing rates Converting customary units word problems Converting metric units word problems Word problems on simple interest Word problems on compound interest Word problems on types of angles Complementary and supplementary angles word problems Double facts word problems Trigonometry word problems Percentage word problems Profit and loss word problems Markup and markdown word problems Decimal word problems Word problems on fractions Word problems on mixed fractions One step equation word problems Linear inequalities word problems Ratio and proportion word problems Time and distance word problems Pythagorean theorem word problems Percent of a number word problems Word problems on constant speed Word problems on average speed Word problems on sum of the angles of a triangle is 180 degree OTHER TOPICS Profit and loss shortcuts Percentage shortcuts Times table shortcuts Time, speed and distance shortcuts Ratio and proportion shortcuts Domain and range of rational functions Domain and range of rational functions with holes Graphing rational functions Graphing rational functions with holes Converting repeating decimals to fractions Decimal representation of rational numbers Finding square root using long division L.C.M method to solve time and work problems Translating the word problems in to algebraic expressions Remainder when 2 power 256 is divided by 17 Remainder when 17 power 23 is divided by 16 Sum of all three digit numbers divisible by 6 Sum of all three digit numbers divisible by 7 Sum of all three digit numbers divisible by 8 Sum of all three digit numbers formed using 1, 3, 4 Sum of all three four digit numbers formed using 0, 1, 2, 3 Sum of all three four digit numbers formed using 1, 2, 5, 6 © All rights reserved. Apart from the stuff given above, if you need any other stuff in math, please use our google custom search here. If you're seeing this message, it means we're having trouble loading external resources on our website. When the degree of the numerator is equal to or greater than that of the denominator, there are other techniques for graphing rational functions. Answer: $f(x) = (2x - 3)/(x^2 + 4)$ Step 1: In the given rational function, the denominator is $x^2 + 4$. Step 2: Equate the denominator to zero and solve for x . $x^2 - 4 = 0 \Rightarrow x^2 = 4 \Rightarrow x = \pm\sqrt{4} = \pm 2$. Step 3: The equations of two vertical asymptotes are $x = -2$ and $x = 2$. When graphing rational functions where the degree of the numerator function is less than the degree of denominator function, we know that $y = 0$ is a horizontal asymptote. Vertical Asymptote: The vertical line $x = a$ is called a vertical asymptote of the graph of $y = f(x)$ if How to find vertical asymptote? The graph of $y = f(x)$ will have vertical asymptotes at those values of x for which the denominator is equal to zero. A graph can have an infinite number of vertical asymptotes, but it can only have at most two horizontal asymptotes. Horizontal asymptotes describe the left and right-hand behavior of the graph. A graph will (almost) never touch a vertical asymptote; however, a graph may cross a horizontal asymptote. We welcome your feedback, comments and questions about this site or page. When the degree of the numerator is less than or greater than that of the denominator, there are other techniques for drawing rational function graphs. onlinemath4all.com Example 2: $f(x) = (x-4)/(-4x-16)$ Solution: Vertical asymptotes: $-4x-16 = 0 \Rightarrow -4x = 16 \Rightarrow x = -4$. So, vertical asymptote is $x = -4$. Horizontal asymptotes: Comparing highest exponents, denominator = numerator Horizontal asymptote = Coefficient of x of numerator / Coefficient of x in the denominator = $-1/4$. So, horizontal asymptote is $y = -1/4$. Example 3: $f(x) = (x+4)/(-2x-6)$ Solution: Vertical asymptotes: $-2x-6 = 0 \Rightarrow -2x = 6 \Rightarrow x = -3$. So, vertical asymptote is $x = -3$. Horizontal asymptotes: Comparing highest exponents, denominator = numerator Horizontal asymptote = Coefficient of x of numerator / Coefficient of x in the denominator = $-1/2$. So, horizontal asymptote is $y = -1/2$. Example 4: $f(x) = (x^3-9x)/(5x^2-6x-9)$ Solution: Vertical asymptotes: $5x^2-6x-9 = 0 \Rightarrow (x-3)(5x+3) = 0 \Rightarrow x = 3$ and $x = -3/5$. So, vertical asymptotes are $x = 3$ and $x = -3/5$. Horizontal asymptotes: Comparing highest exponents, numerator > denominator So, there is no horizontal asymptote. Example 5: $f(x) = (3x^2-12x)/(x^2-2x-3)$ Solution: Vertical asymptotes: $x^2-2x-3 = 0 \Rightarrow (x-3)(x+1) = 0 \Rightarrow x = 3$ and $x = -1$. So, vertical asymptotes are $x = 3$ and $x = -1$. Horizontal asymptotes: Comparing highest exponents, numerator = denominator Coefficient of x from the numerator / coefficient of x in the denominator = $3/1 = 3$. So, the horizontal asymptote is $y = 3$. Example 6: $f(x) = (x^3-16x)/(-4x^2+4x+24)$ Solution: Vertical asymptotes: $-4x^2+4x+24 = 0 \Rightarrow 4x^2-4x-24 = 0 \Rightarrow x^2-x-6 = 0 \Rightarrow (x-3)(x+2) = 0 \Rightarrow x = 3$ and $x = -2$. Horizontal asymptotes: Comparing highest exponents, numerator > denominator So, there is no horizontal asymptote. Example 7: $f(x) = (x^2+2x)/(-4x+8)$ Solution: Vertical asymptotes: $-4x+8 = 0 \Rightarrow -4x = -8 \Rightarrow x = 2$. So, vertical asymptote is $x = 2$. Horizontal asymptotes: Comparing highest exponents, numerator > denominator So, there is no horizontal asymptote. Please submit your feedback or enquiries via our Feedback page. Graphing Rational Functions, n less than m There are different characteristics to look for when graphing rational functions. Answer: $f(x) = (x^2 + 2x - 3)/(x^2 - 5x + 6)$ Step 1: In the given rational function, the denominator is $x^2 - 5x + 6$. Step 2: Equate the denominator to zero and solve for x . $x^2 - 5x + 6 = 0 \Rightarrow (x-2)(x-3) = 0 \Rightarrow x = 2$ or $x = 3$. Step 3: The equations of two vertical asymptotes are $x = 2$ and $x = 3$. Scroll down the page for more examples and solutions on how to find horizontal asymptotes. Find the vertical and horizontal asymptotes of the function given below. Example 1: $f(x) = -4/(x^2 - 3x)$ Solution: Vertical asymptotes: $x^2 - 3x = 0 \Rightarrow x(x-3) = 0 \Rightarrow x = 0$ and $x = 3$. Horizontal asymptotes: Comparing highest exponents, denominator > numerator So, horizontal asymptote is at $y = 0$. Show Video Lesson Graphing Rational Functions, $n = m$ There are different characteristics to look for when creating rational function graphs. $f(x) = 1/(x + 6)$, $f(x) = (2x - 3)/(x^2 + 4)$. If you're behind a web filter, please make sure that the domains *.kastatic.org and *.kasandbox.org are unblocked. Kindly mail your feedback to v4formath@gmail.com We always appreciate your feedback. It is found according to the following: How to find vertical and horizontal asymptotes of rational function?

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